

Functionally Graded, Load Optimized Structure via Additive Manufacturing Techniques

Completed Technology Project (2012 - 2013)



Project Introduction

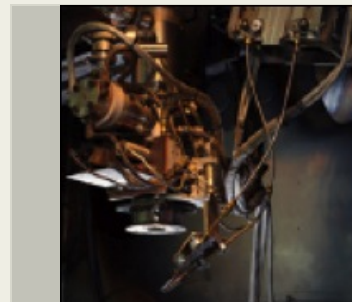
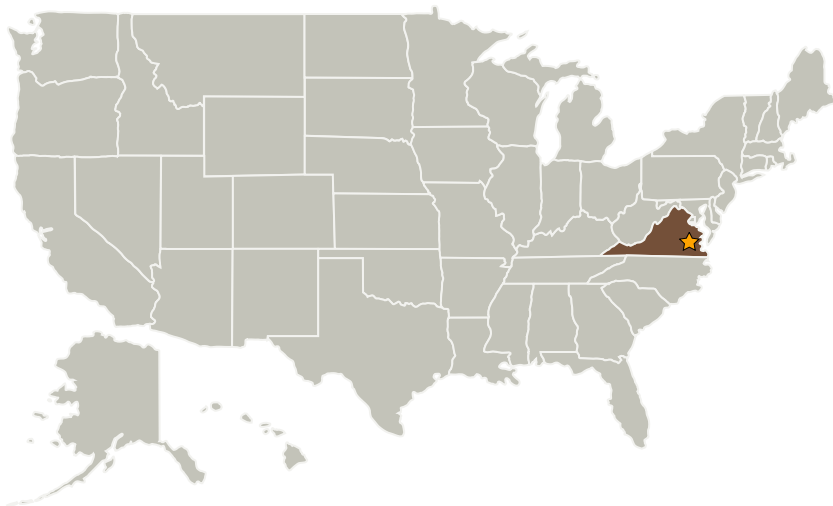
This project seeks to explore new lightweight material and structural concepts through the use of compositionally graded metal alloys fabricated with additive manufacturing techniques.

This project seeks to explore new lightweight material and structural concepts through the use of compositionally graded metal alloys fabricated with additive manufacturing techniques. Currently, load optimization is accomplished through geometric methods assuming monolithic material properties. This new approach will allow alloy composition to be continuously varied in a controlled manner such that chemistry, and thus properties, can also be in the design optimization path. This will be accomplished through the use of reactive gas alloying utilizing additive manufacturing techniques. A NASA Technology Report has been filed for this technology.

Anticipated Benefits

Complex metallic structural components where weight/performance is a critical issue

Primary U.S. Work Locations and Key Partners



Project Image Functionally Graded, Load Optimized Structure via Additive Manufacturing Techniques

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Organizations Performing Work	Role	Type	Location
★ Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia
Lockheed Martin Space Systems(LMSS)	Supporting Organization	Industry	Sunnyvale, California

Primary U.S. Work Locations

Virginia

Images



35.jpg

Project Image Functionally Graded, Load Optimized Structure via Additive Manufacturing Techniques (<https://techport.nasa.gov/image/1259>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

Center Innovation Fund: LaRC CIF

Project Management

Program Director:

Michael R Lapointe

Program Manager:

Julie A Williams-byrd

Project Manager:

Jeffrey A Herath

Principal Investigator:

Craig A Brice

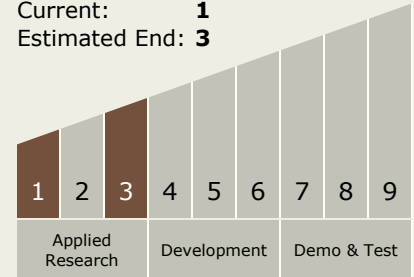
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Technology Maturity (TRL)

Start: **1**
Current: **1**
Estimated End: **3**



Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
 - └ TX12.4 Manufacturing
 - └ TX12.4.1 Manufacturing Processes